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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/024,187	12/21/2001	Koji Wariishi	Q67822	4422
23373	7590	05/07/2004	EXAMINER	
SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			RUTHKOSKY, MARK	
			ART UNIT	PAPER NUMBER
			1745	

DATE MAILED: 05/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/024,187	Applicant(s) WARIISHI, KOJI	
	Examiner Mark Ruthkosky	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 February 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☒ Claim(s) 7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Examiner's Note

The non-final rejection mailed on 7/17/2003 indicated that claims 1-7 were rejected in that office action. To make the record clear, at that point in prosecution only claims 1-6 were presented in the case. No claim 7 was of record. The newly added claim 7 of 2/18/04 was not presented or considered at that time. Newly added claim 7 will be examined and discussed for the first time in this office action.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-6 stand rejected under 35 U.S.C. 102(e) as being anticipated by, or in the alternative, under 35 U.S.C. 103(a) as obvious over McEwen et al. (US 2002/0110739.)

The instant claims are to an electrolyte composition comprising a molten salt represented by the claimed formulae including pyridinium and imidazolium cations, a polymer prepared by a reaction between an electrophile having at least two unsaturated bonds polarized by an electron withdrawing group and a nucleophile having a plurality of nucleophilic groups, and a metal salt containing a Group IA or Group IIA metal ion.

McEwen et al. (US 2002/0110739) teaches an electrolyte composition comprising a molten salt represented by the claimed formulae including pyridinium and imidazolium cations, a polymer and a metal salt containing a Group IA or Group IIA metal ion. Lithium salts combined with an organic cation salt including pyridinium and imidazolium cation salts and a polymer may be included in the mixture. Non-aqueous secondary batteries are further noted, (claims 10-37, the examples and table 2.) Thus, the claims are anticipated.

It is noted that the polymer is a product prepared by a process. MPEP 2113 states, "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." The prior art does not teach the process of making the polymer material. If the claims are not considered to be anticipated, the claims are obvious over the prior art as noted in MPEP 2113.

Claim Rejections - 35 USC § 103

Claims 1-6 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al (US 6,190,805), and further in view of Thrash et al. (US 4,643,958.)

Takeuchi et al (US 6,190,805) teaches a polymer electrolyte composition including nitrogen or phosphorous cation containing salt such as pyridinium and imidazolium cations, metal salts containing a Group IA or Group IIA metal ion and polymer materials (see col. 25, line 55 to see col. 26, line 7, and examples 1-50.) Lithium salts are noted. Non-aqueous secondary batteries are discussed throughout the references including the examples, (claims 10-37, the examples and table 2.) Ammonium salts are noted to have high solubility and dissociation constants in the polymer electrolyte. Takeuchi et al (US 6,190,805) does not teach a mixture of electrolyte salts. Thrash et al. (US 4,643,958) teaches an electrolyte, which combines lithium salts with organic salts including phosphonium, pyridinium and imidazolium cations (col. 6; claims 11-18.) It would be obvious to one of ordinary skill in the art at the time the invention was made to combine the lithium salts and organic salts including pyridinium and imidazolium cations taught in Takeuchi et al (US 6,190,805) as Thrash et al. (US 4,643,958) teaches that the combination of salts will provide an adequate conductivity for the cells while being inert to the cell components. Thrash et al. (US 4,643,958) notes that the combination of salts is preferred (see col. 6, lines 33-end.) Based on the teachings of Thrash et al. (US 4,643,958), one of ordinary skill in the art would combine various salts including lithium salts and ammonium salts in order to allow for efficient operation of the battery. The artisan would have found the claimed invention to be obvious in light of the teachings of the references.

It is noted that the polymer is a product prepared by a process. MPEP 2113 states, "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." The prior art does not teach the process of making the polymer material, however, the product is anticipated by the reference.

Allowable Subject Matter

Claim 7 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is an examiner's statement of reasons for allowance:

Instant claim 7 is to a process for manufacturing an electrolyte composition comprising a molten salt represented by the claimed formulae including pyridinium and imidazolium cations, a polymer prepared by a reaction between an electrophile having at least two unsaturated bonds polarized by an electron withdrawing group and a nucleophile having a plurality of nucleophilic groups, and a metal salt containing a Group IA or Group IIA metal ion, wherein the process comprises adding an electrophile and a nucleophile to the molten salt of the electrolyte and reacting the electrophile and the nucleophile by a Michael-type addition reaction to thereby form a cross-linked polymer. The electrophile has at least two polarized, unsaturated bonds polarized by an electron-withdrawing group. The nucleophile has a plurality of nucleophilic groups,

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wherein the nucleophilic groups are selected from the group consisting of -NH_2 , -SH , -S- , SO_2H , SO_2^- , -OH , and -COOH .

The most pertinent prior art has been presented. McEwen et al. (US 2002/0110739) teaches an electrolyte composition comprising a molten salt represented by the claimed formulae including pyridinium and imidazolium cations, a polymer and a metal salt containing a Group IA or Group IIA metal ion. Lithium salts combined with an organic cation salt including pyridinium and imidazolium cation salts and a polymer may be included in the mixture.

Takeuchi et al (US 6,190,805) teaches a polymer electrolyte composition including nitrogen or phosphorous cation containing salt such as pyridinium and imidazolium cations, metal salts containing a Group IA or Group IIA metal ion and polymer materials (see col. 25, line 55 to see col. 26, line 7, and examples 1-50.) Lithium salts are noted. Non-aqueous secondary batteries are discussed throughout the references including the examples, (claims 10-37, the examples and table 2.) Ammonium salts are noted to have high solubility and dissociation constants in the polymer electrolyte.

The references do not teach a process for manufacturing an electrolyte composition comprising a molten salt represented by the claimed formulae including pyridinium and imidazolium cations, a polymer prepared by a reaction between an electrophile having at least two unsaturated bonds polarized by an electron withdrawing group and a nucleophile having a plurality of nucleophilic groups, and a metal salt containing a Group IA or Group IIA metal ion, wherein the process comprises adding an electrophile and a nucleophile to the molten salt of the electrolyte and reacting the electrophile and the nucleophile by a Michael-type addition reaction to thereby form a cross-linked polymer. The electrophile has at least two polarized, unsaturated

bonds polarized by an electron-withdrawing group. The nucleophile has a plurality of nucleophilic groups, wherein the nucleophilic groups are selected from the group consisting of -NH₂, -SH, -S-, SO₂H, SO₂⁻, -OH, and -COOH. The reference does not teach a method, as claimed, including the addition of an electrophile and a nucleophile to the molten salt of the electrolyte and reacting the electrophile and the nucleophile by a Michael-type addition reaction to thereby form a cross-linked polymer. Thus, the claims are allowed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

Applicant's arguments filed 2/18/2004 have been fully considered but they are not persuasive.

With regard to the rejections based on 35 USC 102/103 over McEwen and the rejection based on 35 USC 103 over Takeuchi in view of Thrash, the applicant argues that the process of making the polymer of the electrolyte is different in the instant invention than in the applied references. The examiner does not dispute the arguments with regard to the process of making the electrolyte noted in the art, however, the claims include product by process limitations for preparing the electrolyte product. The McEwen reference teaches an electrolyte composition comprising a molten salt represented by the claimed formulae including pyridinium and imidazolium cations, a polymer, and a metal salt containing a Group IA or Group IIA metal ion.

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Thus, the reference reads upon the claimed product. MPEP 2113 states, "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." From this, it is noted that the reference reads upon the claims.

The Takeuchi reference teaches a polymer electrolyte composition including nitrogen or phosphorous cation containing salt such as pyridinium and imidazolium cations; metal salts containing a Group IA or Group IIA metal ion and polymer materials. Lithium salts are noted. Takeuchi et al (US 6,190,805) does not teach a mixture of electrolyte salts. Thrash et al. (US 4,643,958) is applied to show teachings in the art of electrolytes, which combine lithium salts with organic salts including phosphonium, pyridinium and imidazolium cations. The applicant does not argue that the combination of electrolytes would be non-obvious. The applicant argues that the process of making the polymer in the instant electrolyte is different than in the prior art. It is again noted that the claims are product-by-process claims and that the combination of references reads upon the claimed product. MPEP 2113 states, "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process."

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Examiner Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Ruthkosky whose telephone number is 571-272-1291. The examiner can normally be reached on FLEX schedule (generally, Monday-Thursday from 9:00-6:30.) If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

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applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mark Ruthkosky

Primary Patent Examiner

Art Unit 1745

Mark Ruthkosky
4/30/04